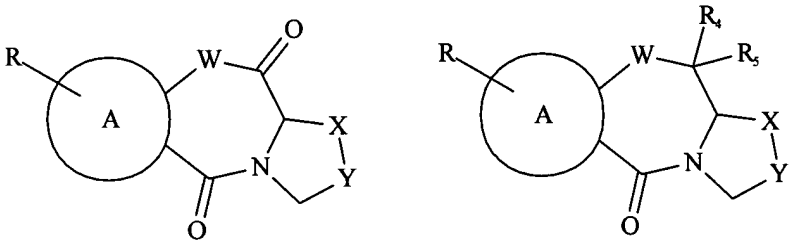
Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-28 (canceled)

Claim 29 (currently amended): A compound having the following formula, or a pharmaceutically acceptable salt thereof:



wherein A is thiazole, benzene, naphthalene, pyridine, pyrimidine, pyrazine, or quinoline;

R is one or more of halogen or NO_2;

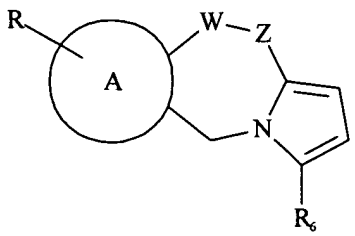
X-Y is CH_2-S, S-CH_2, CH_2-O, CH_2-S(O), S(O)-CH_2, CH_2-CH_2, CH_2-CH_2-CH_2, or CH_2-CH_2-CH_2-CH_2;

R_4 is H or hydroxy;

R_5 is H, phenyl, ~~or alkylamine~~ -alkyl-NH_2, -NH-alkyl, or -N(alkyl)$_2$; and

W is S or O

or wherein the compound is



wherein

A is thiazole, benzene, naphthalene, pyridine, pyrimidine, pyrazine, or quinoline; and

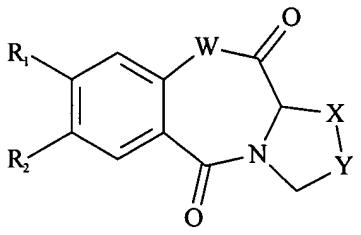
R is one or more of halogen or NO_2;

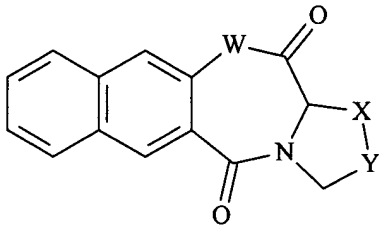
R_6 is H, ~~substituted or~~ unsubstituted alkyl or amine, or alkyl or amine substituted with at least one substituent selected from halogen, alkyl, alkoxy, alkylthio, trifluoromethyl, acyloxy, hydroxy, mercapto, carboxy, aryloxy, aryloxy, aryl, arylalkyl, heteroaryl, amino, alkylamino, dialkylamino, morpholino, piperidino, pyrrolidin-1-yl, or piperazin-1-yl;

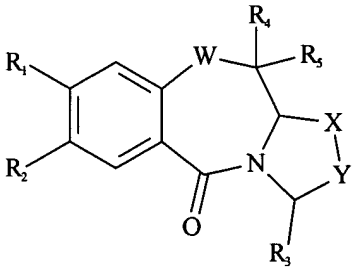
W is S ~~or O~~; and

Z is S, O, CH_2, CH_2CH_2, or C=O.

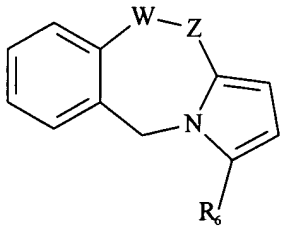
Claim 30 (currently amended): A compound having the following formula, or a pharmaceutically acceptable salt thereof, wherein the compound is:







or



wherein

X-Y is S-CH_2, CH_2-S, S(O)-CH_2, CH_2-S(O), or CH_2CH_2;

Z is S, O, CH_2, CH_2CH_2, or C=O;

W is S or O;

R_1 is H or NO_2;

R_2 is H, halogen, lower alkyl or lower alkoxy;

R_3 is H;

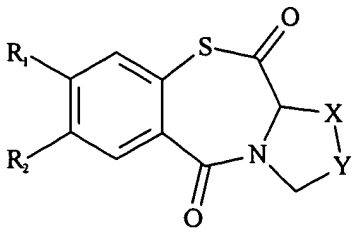
R_4 is hydroxy or H;

R_5 is phenyl or $N(CH_2CH_2)_2NCH_3$; and

R_6 is $CH_2N(CH_2CH_2)_2NCH_3$,

provided that R_1 and R_2 are not both H or not both alkoxy.

Claim 31 (original): The compound of claim 30, wherein the compound is



and R_1 is H or NO_2;

R_2 is H, halogen, lower alkyl or lower alkoxy;

provided that R_1 and R_2 are not both H or not both alkoxy.

Claim 32 (currently amended): The compound of claim 30, wherein

R_1 is H, R_2 is Cl, X-Y is S-CH_2; or

R_1 is H, R_2 is Br, X-Y is S-CH_2; or

R_1 is H, R_2 is CH_3, X-Y is S-CH_2; or

~~R_1 is H, R_2 is H, X-Y is CH_2-S; or~~

R_1 is H, R_2 is Cl, X-Y is CH_2-S; or

R_1 is H, R_2 is Br, X-Y is CH_2-S; or

R_1 is H, R_2 is CH_3, X-Y is CH_2-S; or

R_1 is NO_2, R_2 is H, X-Y is CH_2-S; or

R_1 is H, R_2 is OCH_3, X-Y is CH_2-S; or

~~R_1 is H, R_2 is H, X-Y is CH_2-O; or~~

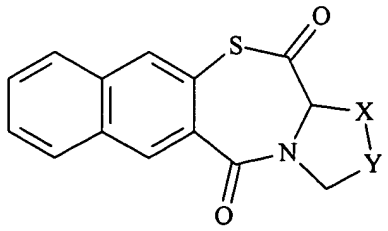
R_1 is H, R_2 is CH_3, X-Y is S(O)-CH_2; or

~~R_1 is H, R_2 is H, X-Y is CH_2-S(O); or~~

R_1 is H, R_2 is Cl, X-Y is CH_2-S(O); or

R_1 is H, R_2 is OCH_3, X-Y is CH_2-S(O).

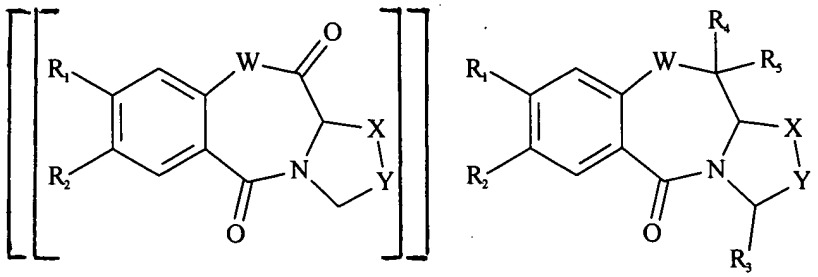
Claim 33 (original): The compound of claim 30, wherein the compound is



and X-Y is S-CH_2 or CH_2-S.

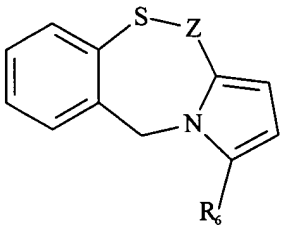
Claim 34 (original): The compound of claim 30, wherein X-Y is S-CH_2.

Claim 35 (currently amended): ~~The compound of claim 30~~ A compound having the following formula, or a pharmaceutically acceptable salt thereof, wherein the compound is:



and R_1, R_2 and R_3 are H, R_4 is OH or H;
W is S or O;
R_5 is Ph or $N(CH_2CH_2)_2CH_3$; and
X-Y is CH_2-CH_2.

Claim 36 (original): The compound of claim 30, wherein the compound is



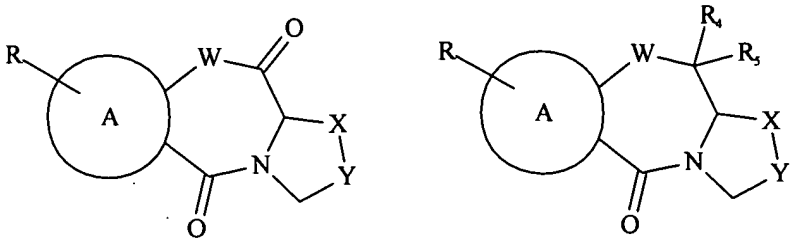
and R_6 is $CH_2N(CH_2CH_2)_2NCH_3$.

Claim 37 (original): A pharmaceutical composition comprising the compound of claim 29, or the pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier.

Claim 38 (original): A pharmaceutical composition comprising the compound of claim 30, or the pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier.

Claims 39-45 (canceled)

Claim 46 (currently amended): A method of inhibiting a HIV integrase, the method comprising: exposing the integrase to an integrase inhibiting amount of one or more anti-integrase compounds selected from the group consisting of the following compounds, or pharmaceutically acceptable salts thereof:



wherein A is thiazole, benzene, naphthalene, pyridine, pyrimidine, pyrazine, or quinoline;

R is one or more of halogen or NO_2;

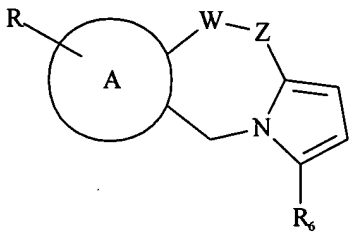
X-Y is CH_2-S, S-CH_2, CH_2-O, CH_2-S(O), S(O)-CH_2, CH_2-CH_2, CH_2-CH_2-CH_2, or CH_2-CH_2-CH_2-CH_2;

R_4 is H or hydroxy;

R_5 is H, phenyl, ~~or alkylamine~~ -alkyl-NH_2, -NH-alkyl, or -N(alkyl)$_2$; and

W is S or O

or wherein the compound is



wherein

A is thiazole, benzene, naphthalene, pyridine, pyrimidine, pyrazine, or quinoline; and

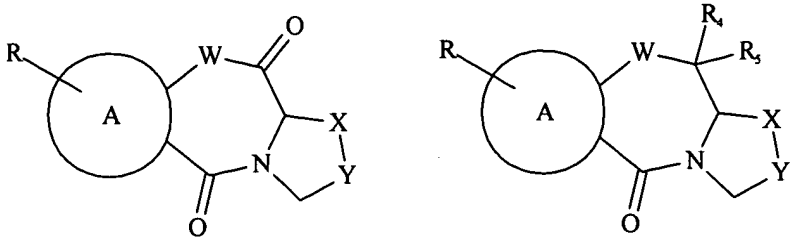
R is one or more of halogen or NO_2;

R_6 is H, ~~substituted or~~ unsubstituted alkyl or amine, or alkyl or amine substituted with at least one substituent selected from halogen, alkyl, alkoxy, alkylthio, trifluoromethyl, acyloxy, hydroxy, mercapto, carboxy, aryloxy, aryloxy, aryl, arylalkyl, heteroaryl, amino, alkylamino, dialkylamino, morpholino, piperidino, pyrrolidin-1-yl, or piperazin-1-yl;

W is S or O; and

Z is S, O, CH_2, CH_2CH_2, or C=O.

Claim 47 (currently amended): A method of treating HIV infection in a subject, comprising administering to the subject a therapeutically effective amount of a compound selected from the group consisting of:



wherein A is thiazole, benzene, naphthalene, pyridine, pyrimidine, pyrazine, or quinoline;

R is one or more of halogen or NO_2;

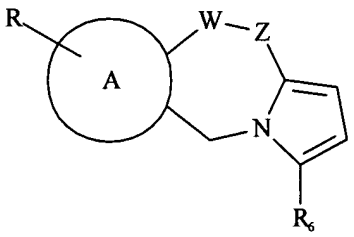
X-Y is CH_2-S, S-CH_2, CH_2-O, CH_2-S(O), S(O)-CH_2, CH_2-CH_2, CH_2-CH_2-CH_2, or CH_2-CH_2-CH_2-CH_2;

R_4 is H or hydroxy;

R_5 is H, phenyl, ~~or alkylamine~~ -alkyl-NH_2, -NH-alkyl, or -N(alkyl)$_2$; and

W is S or O

or wherein the compound is



wherein

A is thiazole, benzene, naphthalene, pyridine, pyrimidine, pyrazine, or quinoline; and

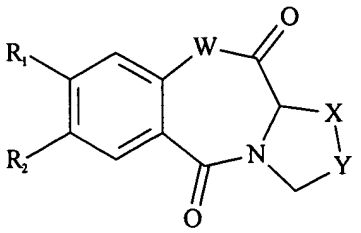
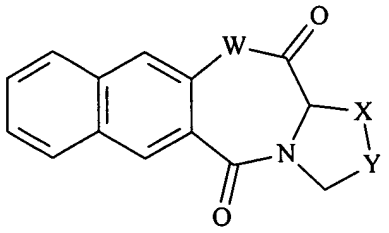
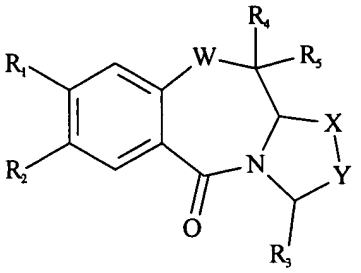
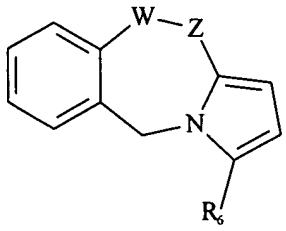
R is one or more of halogen or NO_2;

R_6 is H, ~~substituted or~~ unsubstituted alkyl or amine, or alkyl or amine substituted with at least one substituent selected from halogen, alkyl, alkoxy, alkylthio, trifluoromethyl, acyloxy, hydroxy, mercapto, carboxy, aryloxy, aryloxy, aryl, arylalkyl, heteroaryl, amino, alkylamino, dialkylamino, morpholino, piperidino, pyrrolidin-1-yl, or piperazin-1-yl;

W is S or O; and

Z is S, O, CH_2, CH_2CH_2, or C=O.

Claim 48 (currently amended): A method of inhibiting a HIV integrase, the method comprising: exposing the integrase to an integrase inhibiting amount of one or more anti-integrase compounds selected from the group consisting of the following compounds, or pharmaceutically acceptable salts thereof:




or


wherein

X-Y is S-CH_2, CH_2-S, S(O)-CH_2, CH_2-S(O), or CH_2CH_2;

Z is S, O, CH_2, CH_2CH_2, or C=O;

W is S or O;

R_1 is H or NO_2;

R_2 is H, halogen, lower alkyl or lower alkoxy;

R_3 is H;

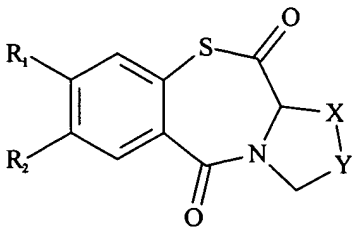
R_4 is hydroxy or H;

R_5 is phenyl or $N(CH_2CH_2)_2NCH_3$; and

R_6 is $CH_2N(CH_2CH_2)_2NCH_3$,

provided that R_1 and R_2 are not both H or not both alkoxy.

Claim 49 (previously presented): The method of claim 48, wherein the compound is



and R_1 is H or NO_2;

R_2 is H, halogen, lower alkyl or lower alkoxy;

provided that R_1 and R_2 are not both H or not both alkoxy.

Claim 50 (currently amended): The method of claim 48, wherein

R_1 is H, R_2 is Cl, X-Y is S-CH_2; or

R_1 is H, R_2 is Br, X-Y is S-CH_2; or

R_1 is H, R_2 is CH_3, X-Y is S-CH_2; or

~~R_1 is H, R_2 is H, X-Y is CH_2-S; or~~

R_1 is H, R_2 is Cl, X-Y is CH_2-S; or

R_1 is H, R_2 is Br, X-Y is CH_2-S; or

R_1 is H, R_2 is CH_3, X-Y is CH_2-S; or

R_1 is NO_2, R_2 is H, X-Y is CH_2-S; or

R_1 is H, R_2 is OCH_3, X-Y is CH_2-S; or

~~R_1 is H, R_2 is H, X-Y is CH_2-O; or~~

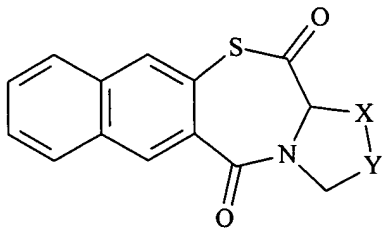
R_1 is H, R_2 is CH_3, X-Y is S(O)-CH_2; or

~~R_1 is H, R_2 is H, X-Y is CH_2-S(O); or~~

R_1 is H, R_2 is Cl, X-Y is CH_2-S(O); or

R_1 is H, R_2 is OCH_3, X-Y is CH_2-S(O).

Claim 51 (previously presented): The method of claim 48, wherein the compound is

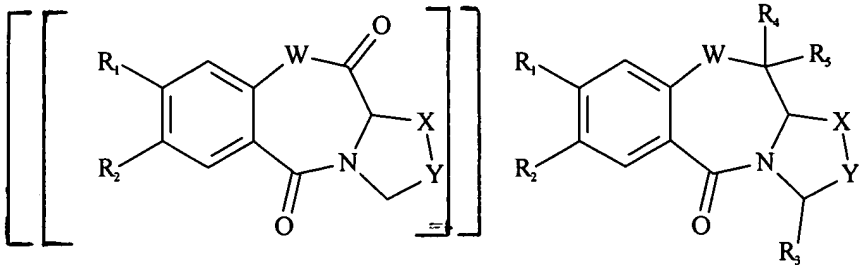


and X-Y is S-CH_2 or CH_2-S.

Claim 52 (previously presented): The method of claim 48, wherein X-Y is S-CH_2.

Claim 53 (currently amended): The ~~method of claim 48, wherein the compound is:~~ A method of inhibiting a HIV integrase, the method comprising:

exposing the integrase to an integrase inhibiting amount of one or more anti-integrase compounds selected from the group consisting of the following compounds, or pharmaceutically acceptable salts thereof, wherein the compounds are:



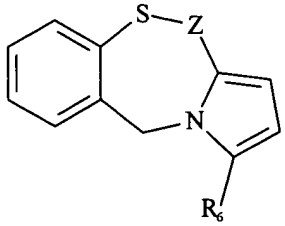
and R_1, R_2 and R_3 are H, R_4 is OH or H;

W is S or O;

R_5 is Ph or $N(CH_2CH_2)_2CH_3$; and

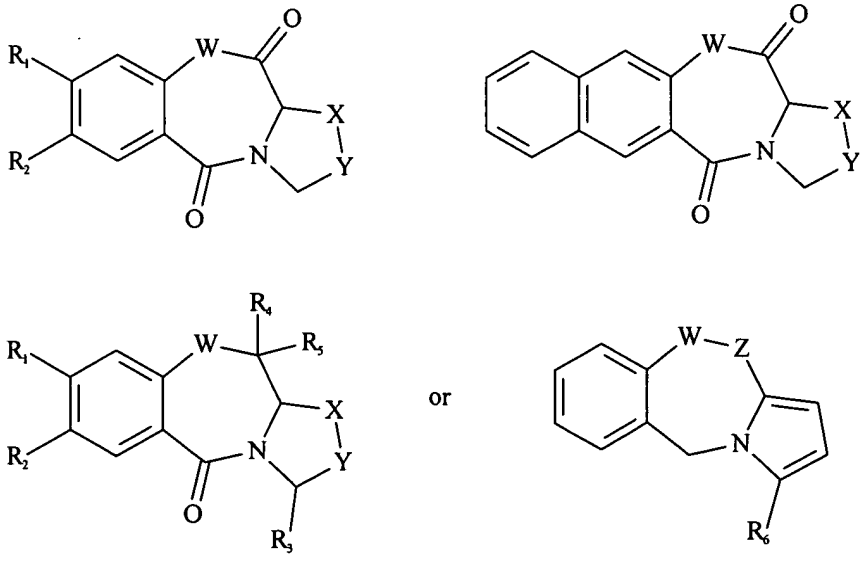
X-Y is CH_2-CH_2.

Claim 54 (previously presented): The method of claim 48, wherein the compound is



and R_6 is $CH_2N(CH_2CH_2)_2NCH_3$.

Claim 55 (currently amended): A method of treating HIV infection in a subject, comprising administering to the subject a therapeutically effective amount of a compound selected from the group consisting of:



wherein

X-Y is S-CH_2, CH_2-S, S(O)-CH_2, CH_2-S(O), or CH_2CH_2;

S, O, CH_2, CH_2CH_2, or C=O;

W is S or O;

R_1 is H or NO_2;

R_2 is H, halogen, lower alkyl or lower alkoxy;

R_3 is H;

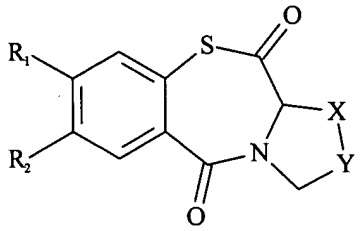
R_4 is hydroxy or H;

R_5 is phenyl or $N(CH_2CH_2)_2NCH_3$; and

R_6 is $CH_2N(CH_2CH_2)_2NCH_3$,

provided that R_1 and R_2 are not both H or not both alkoxy.

Claim 56 (previously presented): The method of claim 55, wherein the compound is



and R_1 is H or NO_2;

R_2 is H, halogen, lower alkyl or lower alkoxy;

provided that R_1 and R_2 are not both H or not both alkoxy.

Claim 57 (currently amended): The method of claim 55, wherein

R_1 is H, R_2 is Cl, X-Y is S-CH_2; or

R_1 is H, R_2 is Br, X-Y is S-CH_2; or

R_1 is H, R_2 is CH_3, X-Y is S-CH_2; or

~~R_1 is H, R_2 is H, X-Y is CH_2-S; or~~

R_1 is H, R_2 is Cl, X-Y is CH_2-S; or

R_1 is H, R_2 is Br, X-Y is CH_2-S; or

R_1 is H, R_2 is CH_3, X-Y is CH_2-S; or

R_1 is NO_2, R_2 is H, X-Y is CH_2-S; or

R_1 is H, R_2 is OCH_3, X-Y is CH_2-S; or

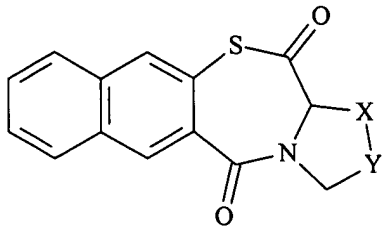
~~R_1 is H, R_2 is H, X-Y is CH_2-O; or~~

R_1 is H, R_2 is CH_3, X-Y is S(O)-CH_2; or

~~R_1 is H, R_2 is H, X-Y is CH_2-S(O); or~~

R_1 is H, R_2 is Cl, X-Y is CH_2-S(O); or
R_1 is H, R_2 is OCH_3, X-Y is CH_2-S(O).

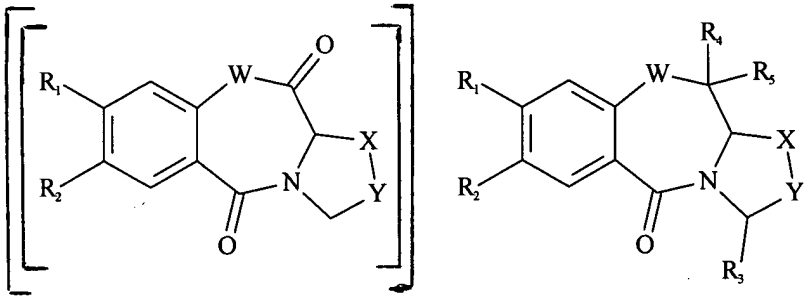
Claim 58 (previously presented): The method of claim 55, wherein the compound is



and X-Y is S-CH_2 or CH_2-S.

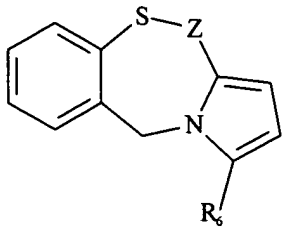
Claim 59 (previously presented): The method of claim 55, wherein X-Y is S-CH_2.

Claim 60 (currently amended): ~~The method of claim 55, wherein the compound is:~~ A method of treating HIV infection in a subject, comprising administering to the subject a therapeutically effective amount of a compound selected from the group consisting of:



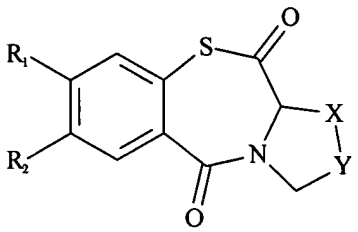
~~and~~ wherein R_1, R_2 and R_3 are H, R_4 is OH or H;
W is S or O;
R_5 is Ph or $N(CH_2CH_2)_2CH_3$; and
X-Y is CH_2-CH_2.

Claim 61 (previously presented): The method of claim 55, wherein the compound is



and R_6 is $CH_2N(CH_2CH_2)_2NCH_3$.

Claim 62 (new): A compound having the following formula, or a pharmaceutically acceptable salt thereof, wherein the compound is:

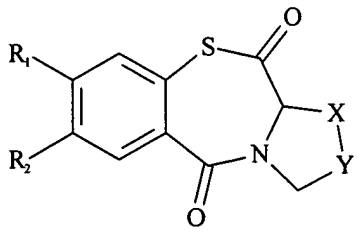


wherein X-Y is S-CH_2, CH_2-S, S(O)-CH_2, or CH_2-S(O);

R_1 is H or NO_2; and

R_2 is H, halogen, lower alkyl or lower alkoxy.

Claim 63 (new): A method of inhibiting a HIV integrase, the method comprising:
exposing the integrase to an integrase inhibiting amount of one or more anti-integrase compounds selected from the group consisting of the following compounds, or pharmaceutically acceptable salts thereof:

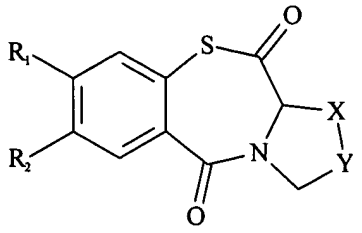


wherein X-Y is S-CH_2, CH_2-S, S(O)-CH_2, or CH_2-S(O);

R_1 is H or NO_2; and

R_2 is H, halogen, lower alkyl or lower alkoxy.

Claim 64 (new): A method of treating HIV infection in a subject, comprising administering to the subject a therapeutically effective amount of a compound selected from the group consisting of:



wherein X-Y is S-CH_2, CH_2-S, S(O)-CH_2, or CH_2-S(O);

R_1 is H or NO_2; and

R_2 is H, halogen, lower alkyl or lower alkoxy.